

# HESITANCY IN COMMITTING TO LARGE-SCALE ENTERPRISE SYSTEMS SOLUTIONS

## *Experiences at a Multi-national Corporation*

Chris Barry and Wojtek Sikorski

*Department of Accountancy and Finance, National University of Ireland Galway, Galway, Ireland*

**Keywords:** Enterprise systems, Enterprise Resource Planning, ERP benefits, ERP myths, ERP misfits, systems implementation.

**Abstract:** While early cited benefits of Enterprise Resource Planning (ERP) or enterprise systems remain for the most part highly desirable, it is often the case that the promise of delivery differs from reality. Many now agree that achieving enterprise systems benefits is complex, cumbersome, risky and expensive. Furthermore many ERP projects do not fully achieve expectations. This paper takes a critical lens to the prospect of a firm achieving enterprise systems' benefits and presents the findings of a case study that examines the underlying managerial and organizational reasons of one multi-national enterprise for, at least, postponing ERP implementation. It reveals a rich picture of implementation motivators, inhibitors and the perceived and real benefits of enterprise systems.

## 1 INTRODUCTION

Key benefits of enterprise systems have long been cited (Koch, Slater and Baatz, 1999; Sumner, 2005) – they can improve the effectiveness of firms through the automation and integration of business processes, allowing information to be shared across the organisation. Enterprise systems have been promoted as a solution to: remove the backlog; overcome IS staffing problems; and institutionalize best practice. However, the mass wave of implementations in the 1990s when most Fortune 500 firms installed enterprise systems has, for some, delivered a reality that differs from expectations.

The task of enterprise systems implementation is now recognized as complex and cumbersome - and there are legendary failures that make salutary reading (Davenport, 1998; Chen, 2001). In order to realise anticipated value from ERP investments, simple assembly of the raw technical components is just not enough (Davenport, Harris and Cantrell, 2004). Scholars now agree that ERP benefits never come easily nor cheaply (Robey, Ross and Boudreau, 2002; Daneva and Wieringa, 2005) and many ERP projects do not achieve expectations (Holsapple, Wang and Wu, 2005).

It would appear that little research has been conducted that looks at reasons why firms do not

adopt integrated enterprise systems – not because they have failed to consider doing so, but following deliberate analysis. In light of growing evidence of the dangers of a head-long rush into implementation, the experiences of one firm that has paused for breath should prove valuable.

## 2 BACKGROUND TO THE RESEARCH

### 2.1 ERP Decision Rationale

The rationale for implementation varies between, and even within, companies. This situation reflects multiple factors affecting an ERP implementation decision (Ross, Vitale and Willcocks, 2003) and the richness of enterprise systems in terms of functionality and potential benefits (Markus and Tanis, 2000). Ross et al (2003) group motivators into three major categories: infrastructure, capability and performance. Organisations quoting IT infrastructure as a major ERP motivator hope to solve their information and business fragmentation problems (Themistocleous, Irani, O'Keefe and Paul, 2001) and reduce the vast quantities of data spread across hundreds of separate legacy systems

(Davenport, 1998). Some perceive improvement in organisational capability as the underlying motivation for ERP implementation (Mabert, Soni and Venkataramanan, 2001), while others want to improve specific processes, such as logistics, human resources or customer service (Ross et al., 2003).

Additional motivators are the need to improve and standardize complex, inconsistent, and ineffective business processes to ensure the quality and predictability of global business processes (Deloitte Consulting, 1999; Markus and Tanis, 2000; Ross et al., 2003). A final group of motivators look at ERP as a tool to 'fix' declining organisational performance or to gain a competitive advantage (Mabert et al., 2001; Bajwa et al., 2004).

## 2.2 ERP Benefits

In order to understand the value of ERP systems for an organisation, perceived benefits were explored. Shang and Seddon (2002) present a comprehensive framework of potential benefits that can be used as a communication tool and check list for consensus building within the firm. It may also be used as an instrument for managing value realization issues.

The first dimension of the framework describes operational benefits which include: improvements in efficiency, effectiveness and the productivity of business processes (Trott and Hoecht, 2004); reductions of cycle time (Deloitte Consulting, 1999; Gupta, 2000; Gattiker and Goodhue, 2005); as well as decreases in data collection and processing duplication (Trott and Hoecht, 2004). A second dimension numerates managerial benefits like: access to more accurate, high quality and real-time data; operating information (Davenport, 1998; Chen, 2001; Mabert et al., 2001; Hitt, Wu and Zhou, 2002; Trott and Hoecht, 2004) which improves the decision making process; and facilitating cost tracking capabilities and generally improving managerial and operational control (Palaniswamy and Frank, 2002; Trott and Hoecht, 2004). A third dimension looks at strategic benefits where ERP systems with their large scale business involvement and internal/external integration capabilities present a new opportunity for achieving competitive differentiation. A fourth dimension categorizes IT benefits like the potential to standardize interfaces (Mabert et al., 2001) and facilitating business flexibility for current and future changes like growth and expansion (Bajwa et al., 2004). The last dimension of the framework describes organisational benefits which include improved employee satisfaction by removing tedious activities, improved employee involvement in decision making processes (Barker and Frolick, 2003) and lowered barriers

between business functions and departments by providing a unified enterprise view of the business (Gupta, 2000; Umble, Haft and Umble, 2003).

## 2.3 ERP 'Misfits'

The benefits from ERP adoption cited above may seem encouraging for organisations, however many firms fail to achieve them (Markus, Axline, Petrie and Tanis, 2000; Wang, Klein and Jiang, 2006). This may be explained by the idea of a 'misfit' between the functionality of the package and organisations' needs (Soh, Sia, Boh and Tang, 2003; Holsapple et al., 2005). These gaps are more likely to happen where enterprise systems are commercial packages from software vendors rather than tailor-made, in house applications (Markus and Tanis, 2000). Mass production of ERP software separates the process of development and use between different organisations. This means that when an organisation decides to acquire off-the-shelf ERP, the choices made at the design stage have inevitably achieved a certain level of closure and thus have a heavy influence on the shaping of the system at the implementation stage (Wang et al., 2006).

Kien and Soh (2003) numerate a few sources of misfits: country specific misfit - focuses on the unique regulatory, economic, social, or cultural practices among the countries; industry specific misfits - caused by incompatibilities between practices assumed by the ERP system and the unique practices specific to some industries; and sector specific misfits. Finally organisational misfit is more widely described as incompatibilities between ERP package functionality and the organisational structure, strategy, user composition, management styles and procedures.

According to Davenport (1998) a key ERP selling point of 'integration across the enterprise' may itself be the reason for organisation-specific misfits. Chen (2001) claims that the organisation might simply not be positioned for integration. ERP systems are a better fit for rigid, disciplined, centralized structures with hierarchical, command-and-control organisations and uniform cultures as they force centralization of control over information and the standardization of processes (Davenport, 1998). Further misfits might occur in organisations with a strong functional orientation as ERP packages compel staff to work within an expanded work environment where consideration of inter-related processes becomes unavoidable. This stimulant may involve changes in workflow since the handling of transactions is no longer limited by functional boundaries. The system and employees now see a

transaction through from start to finish. These changes may simply not fit the organisation's practices. Furthermore many features of ERP systems are simply at odds with flexibility and innovation in organisations - this is a key mismatch.

The most successful and widely recommended misfit 'resolution strategy' is to align the firm's processes to the ERP strategy using business process reengineering (BPR). This approach was widely used in extensive ERP implementations in the 1990s. While some scholars commonly agree there are potential benefits from BPR (Davenport, 1998; Chen, 2001; Sumner, 2005), others warn that it is a very delicate process and must be carefully aligned with organisational strategy (Gattiker and Goodhue, 2002; Somers and Nelson, 2003). To reap the greatest benefits companies should have "management structures in harmony, rather than at war, with their core processes" (Hammer and Stanton, 1999; p.2).

#### 2.4 ERP 'Myths'

Literature also reveals ERP 'myths' that are based on a generic view of how the system was intended to work. In reality many implementations result in much dissatisfaction and misalignment (Dowlatshahi, 2005). Initially software vendors offered ERP packages as a complete integrated solution capable to address every information processing need of the organisation (Markus and Tanis, 2000; Themistocleous et al., 2001; Davenport et al., 2004). In reality limited functionality meant ERP systems instead of being a single, integration solution, became a great integration challenge (Linthicum, 1999). Firms were forced to source third party software in order to integrate ERP with other systems. Implementation of core enterprise functionality is just the beginning of an ongoing integration process (Davenport et al., 2004). The universal and 'holistic' purpose of ERP software made them very complex to use as well as extremely difficult to implement (Markus and Tanis, 2000).

Another misconception of ERP software concerns its decision support capabilities. Although improved decision making capabilities are cited as one of the benefits, ERP typically lack decision support functionality. ERP packages cannot be perceived as decision support systems (DSS) as they originated as integrated collections of transaction processing systems. They were not intended to fulfil companies' needs for business reporting and decision support (Sprague, 1980; Markus and Tanis, 2000). Lack of decision support in an ERP package

forces organisations to struggle to create operational and management reports - sometimes resulting in the re-keying of data into spreadsheets. Separate or bolt-on applications like business intelligence or business analytics are the contemporary successor to DSS.

Additionally ERP implementation brings: a variety of hidden costs like training, integration, testing, customization, data conversion, data analysis; 'sticky' consultants; the loss of key staff; a prolonged implementation phase; unachieved ROI; and finally post-ERP depression (Koch et al., 1999).

### 3 OBJECTIVES OF THE RESEARCH

The broad objective of the research presented in this paper was to explore factors inhibiting the adoption of fully integrated enterprise systems in a multinational organisation in Ireland. A number of other objectives were: to assess the historical context of IT infrastructure and its current functionality; to understand senior management rationale in undertaking ERP decisions in respect of the framework discussed earlier by Ross et al (2003); to identify perceived benefits of ERP implementation in respect of the framework introduced by Shang and Seddon (2003); and finally to explore the perceived challenges of ERP implementation.

IS solutions are usually described from the perspective of adoption issues. Much of the relevant ERP literature on information systems makes a near-automatic assumption that new technologies are necessary. What are rarely contemplated are the reasons for non-adoption - not the absence of consideration, but the rationale why a firm decides to hold back from falling in line with industry-wide consensus. This case study attempts to identify those reasons from the perspective of an organisation who decides to delay or reconsider ERP investment.

### 4 RESEARCH METHOD

The case study looked at a multinational organisation, Baxter Healthcare, with two manufacturing subsidiaries based in Ireland. Triangulation of multiple sources of data was used in order to ensure robust data collection. The following data collection techniques were used: semi-structured interviews with local and European level managers; observation, to understand existing procedures and day to day duties at the local level;

and an examination of extant documentation and the organisational intranet.

It was felt that the methods described above (personal interviews, observation and documentation review) would deliver rich information demanded by a case study research strategy. The information collected facilitated in-depth analysis and was helpful in gaining a deep understanding of the context of the research and the processes being performed in the case study organisation. It is believed that the investigation of complex issues like the perceived value of ERP systems and understanding the rationale of IS decision making were ensured by this research strategy.

## **5 CASE STUDY FINDINGS AND ANALYSIS**

### **5.1 Organisational Background**

Baxter Healthcare is a global healthcare company manufacturing products used in the treatment of complex medical conditions including haemophilia, immune disorders, kidney disease, cancer, trauma and other conditions. It employs 48,000 employees worldwide and generated over \$10 billion net sales in 2006. The two Irish manufacturing units employ about 1200 people. These plants are well established, successful and have managed to gain a competitive advantage over competitors on Irish and global market for over thirty years.

The organisation does not use a 'global ERP system' - instead it operates using multiple, highly customized systems as well as many legacy systems. The systems are old, badly integrated, have lots of interfaces with poor flow of data and transparency. Each function in every system works within its own 'load' of systems and applications – there is no real time data flow. Data is transmitted manually between 'loads' using Excel spreadsheets and Access queries.

Despite numerous inefficiencies associated with the IT infrastructure and data fragmentation, the organisation manages to deliver superior service to its final customers. The general manager of Irish operations tellingly reported: "...we still manage to be very effective in terms of customer service, quality, and continuously reducing our costs. We probably have the most successful track records at not only offsetting inflation but reducing our costs every year."

### **5.2 Historical Development of IS Infrastructure**

Participants in this study mention historical reasons as one of the biggest factors influencing the current state of IT in the organisation. Initially when the organisation started investing in Europe, it was granted a lot of IT and business independence for each manufacturing subsidiary in every country. A continuation of this policy, fast growing European business, mergers and acquisitions (not well-managed from an IT point of view) resulted in 51 instances of enterprise systems with 321 bolt-ons and 773 different interfaces around the globe.

In 1999 and 2000 the Finance Department alone operated 22 different financial systems across Europe. A similar situation was identified in the supply chain and manufacturing applications. As the result of incoherent policy, three major systems evolved: a common, regional distribution system but working only on the supply chain, and two different manufacturing systems used to manage in-house finished products and raw materials. Each of these systems has separate installations in every plant.

In addition to IT systems dispersion, organisational structure was also decentralized from the organisational point of view. One of the managers said "we had few expanded divisions with independent captains on the ship. In Europe we had five captains and one ship." At that point in time, having committed large amounts of money to in-house developed systems and with decentralized business processes, the firm began to consider global ERP implementation. The only ERP module that was implemented since then however was JD Edwards Financials that combines all 22 existing financial systems into one common platform.

### **5.3 Considering ERP**

The motivators and rationale for implementation identified in this case study varied amongst respondents. Similar experience was described in the literature by Ross et al (2003). This situation was claimed to reflect a variety of factors affecting an ERP implementation decision. The biggest differences in motivators were found to be between headquarters and the local level.

### 5.3.1 Technical Infrastructure

Technical infrastructure is perceived as one of the greatest motivators to implement an ERP system in the literature. Reasons cited are the lack of integration and compatibility of existing systems, and lack of standardization (Markus et al., 2000; Chen, 2001; Mabert et al., 2001; Palaniswamy and Frank, 2002; Bajwa et al., 2004). Respondents in the case study perceived IT infrastructure motivators as a benefit of ERP implementation. However it was clearly stated that the IT infrastructure should not drive ERP implementation - rather it should be seen as a catalyst to achieving business benefits.

### 5.3.2 Organisational Capability

From the organisational capability point of view the need to improve and standardize the quality of global business processes as well as process automation and redesign were identified in the literature as a major motivator for ERP implementation. Participants in this case study agreed that they considered the improvement of global business processes in their ERP feasibility study. However since hardly any global business process was discovered, it was decided that this would not drive an ERP decision. In the manufacturing units automation and redesign was believed to be the major motivator to implement not only ERP but any other IT system providing that it delivers an adequate return on investment.

### 5.3.3 Organisational Performance

Declining organisational performance is also cited in the literature as a motivator in the rationale for ERP investment. However, respondents were very sceptical about this motivation. Huge initial investment and project challenges were given as the main reasons for this benefit to be unachievable in the short term. They expressed the view that declining organisational performance would instead inhibit large-scale ERP investment. While they considered ERP a good long term solution to improving organisational performance, in the short term managerial skills were perceived as the crucial ones.

Additionally, management underlined the significant influence of risk factors on the ERP decision. This aspect of the ERP decision rationale was not described in the literature reviewed. The risk factors were felt to be particularly important in such a fragile business like healthcare. Concern was expressed that failures in ERP implementation could

affect, for example, delivery of product to patients with critical kidney diseases.

## 5.4 Perceived ERP Benefits

### 5.4.1 Operational Benefits

From the research conducted, the most important perceived benefit and driver for ERP implementation in the organisation is the possibility of general operating cost reduction which correlates with the literature reviewed (Deloitte Consulting, 1999; Bajwa et al., 2004; Ragowsky et al., 2005; Sumner, 2005). It was felt that the only possible way to reduce the general operating cost is to lower the headcount. All the other benefits revealed by the literature were said to be components that, combined together, could bring about general operating cost reduction.

Managers at both European and local level mentioned automation benefits coming from ERP implementation. This finding correlates with Themistocleous et al (2001). It was highlighted however on the local level that custom built stand alone systems might address automation needs better and cheaper than ERP systems.

Benefits of cycle time reduction was commonly agreed by respondents in line with the literature findings. Some of the reductions were believed to come from BPR and some from having only one system. Opportunities for further reductions were determined if more ERP modules were implemented.

Reduction of data collection and processing duplication efforts were perceived as an ERP benefit by all respondents. While some savings were identified from this benefit they were not noted as being significant compared to the amount of money that would have to be invested in an ERP system. Total savings achieved on headcount reduction enabled by combined operational advantages were said to be insufficient to ensure an adequate return on an ERP investment.

### 5.4.2 Managerial Benefits

On the European level it was agreed that ERP can improve the decision making process for senior management. This benefit was felt to be a result of the combined advantages of improved visibility and consistency of higher quality data. Those advantages mentioned by European level managers correlate with literature findings. On the local level it was believed that ERP has a positive influence on

operational and managerial control in the organisation in general, as claimed in the literature (Palaniswamy and Frank, 2002; Trott and Hoecht, 2004). Although it was agreed by managers that ERP facilitates achievement of the benefits stated above, it was stressed that managerial skills and quality of personnel are equally important.

Other benefits cited in the literature like: improved inventory turnover; improved bill of material and routing accuracy; and faster decision making process were not perceived as benefits stemming from ERP implementation. These were said to be dependent on good management practices.

#### 5.4.3 Strategic Benefits

As noted by the literature, benefits of alignment, standardization and improvements to business processes were achieved at Baxter via the JD Edwards Financials implementation. Managers at the European level commonly claimed that this is one of the biggest benefits of ERP. At the local level however it was felt that the benefit of standard business processes was achieved as a trade off for lost customization and overemphasis of the systems' importance rather than business fundamentals.

#### 5.4.4 IT Infrastructure Benefits

This category of benefits was most widely acknowledged by respondents. The following advantages were associated with ERP systems: elimination of fragmentation of data; support in integrating mergers and acquisitions; and easier upgrades and standardization of interfaces. Although these benefits were clearly visible for management it was decided at the headquarters level that perceived IT benefits should not drive ERP implementation decisions.

Other benefits cited in the literature: support for organisational needs and support for business growth were perceived as dependent on good business management and people skills rather than on IT systems.

#### 5.4.5 Organisational Benefits

Although the literature numerates a few organisational advantages like: removing redundancy and tediousness from day to day activities; facilitating more time for value added duties; employee involvement in decision making process; and lower barriers between business functions and departments, respondents did not associate any of those benefits with ERP

implementation. This finding reveals, once again, a common management view that these types of issues depend on organisation and management and not on IT.

### 5.5 Perceived ERP Challenges

Misfits between ERP and organisational needs highlighted by the literature (organisational integration misfit, organisational orientation misfit and business strategy misfit) were also discovered in the researched organisation. Those issues however were said to be managerial challenges that need to be solved prior to ERP implementation. They were said not to be prohibitive to the implementation decision.

Strategic misfit discovered at the local level was felt to be inhibitive to the organisation implementing ERP. This finding corresponds with literature reviewed (Davenport, 1998; Markus and Tanis, 2000; Hitt et al., 2002). Scholars agreed that organisations realizing a cost leadership strategy should not invest in ERP systems as it was not proven that it is able to bring about a return on investment. The situation in the organisation being studied seems to be similar to Air Product and Chemicals (Davenport, 1998) who decided not to implement ERP since management was afraid that huge investment with no guaranteed return would force prices increases.

Respondents were aware of ERP disadvantages like: hidden costs of ERP implementation; lack of functionality and integration issues; and lack of decision support. Combining all the disadvantages together the high total cost of ERP was believed to be the most serious and prohibitive one for the organisation.

## 6 CONCLUSIONS

It is concluded that the current state of information systems in the organisation evolved as a result of: an historical decentralization of business processes; enormous independence granted to autonomous strategic business units; rapid business growth; and the lack of a clear acquisition policy. Most of the legacy systems currently operating in the organisation are very highly customized, regionalized and developed in-house by independent strategic business units. The combined value of these systems and investments was perceived as being hugely significant. The idea of treating these as a sunk cost that the firm would have to bear in

discarding them seriously mitigated against the adoption of large-scale, global ERP.

Respondents were commonly aware of multiple benefits and improvements that ERP implementation could bring for the IT infrastructure. It was concluded however that IT infrastructure should not drive ERP implementation. ERP should be looked at as a business catalyst to achieve business benefits. This was a mature and reflective view, distinctively counter-consensual.

In terms of organisational capabilities, standardization of business processes across the regions was stated as a motivation for ERP implementation. On the manufacturing level every opportunity to automate processes was stressed as a major motivator. It was concluded however that stand alone systems can meet this need better as they are cheaper and highly customized. Organisational performance is concluded to be a factor affecting the ERP decision. In the short and medium term however, ERP was not perceived as an appropriate tool to improve organisational performance. While it was believed that ERP could increase global organisational performance in the long term, respondents felt that increased overall performance would not ensure a return on the combination of a huge initial investment and the sunk cost of discarded legacy systems. In this situation it was concluded that the organisation could get more value for its money investing in product development rather than IT.

All the operational benefits of ERP for the firm were perceived as enabling headcount reduction in the organisation. This was felt to be the only way to achieve major saving in operating costs. Respondents agreed that JD Edwards Financials implementation achieved less than 50 percent of the headcount reduction target at the country level. This saving was not seen as being satisfactory in achieving an adequate return on investment. It is concluded that while respondents were aware of most benefits ERP could bring, their value was not deemed enough to justify the investment.

Respondents were aware of all the misfits and challenges of ERP systems cited in the literature. Most of these however were considered managerial challenges that need to be solved prior to ERP implementation. Thus, organisational integration misfits, organisational orientation misfit and BPR were not thought to be inhibitors of ERP implementation. Lack of functionality, integration problems and lack of decision support were identified as disadvantages of ERP systems. Management felt however that those disadvantages

could be overcome by using middleware software to integrate ERP back to other existing systems and implementing reporting tools to sit on top of an ERP. Those solutions were however perceived as adding to a vast ERP cost outlay. Concern was also expressed that a massive investment without the certainty of a fast return could cause misalignment with the cost leadership strategy of manufacturing units.

For many businesses ERP implementation is now almost a de facto position towards which they inexorably gravitate. For Baxter Healthcare, all the above points to a firm that is acting counter to an industry-wide consensus. It is not a laggard, resistant to new technologies and unaware of the potential of enterprise systems. It is not the contemplation of disruptive organisational change that worries them. The pragmatism of the organisation in focussing on cost and stability, in spite of their acknowledged understanding of the benefits of standardized business processes and the potential to improve organisational performance, runs against the apparent sentiment evidenced in widespread ERP adoptions. A contrary view, revealed here, is that there are wholly rational reasons why a firm decides to stand back from adoption in consideration of maintaining organisational alignment, forgoing potential benefits and avoiding risk by emphasising a medium rather than a longer term perspective.

## REFERENCES

- Bajwa, D. S., Garcia, J. E., & Mooney, T. (2004). An Integrative Framework for the Assimilation of Enterprise Resource Planning Systems: Phases, Antecedents, and Outcomes. *Journal of Computer Information Systems*, 44(3), 81-90.
- Barker, T., & Frolick, M. N. (2003). ERP Implementation Failure: A Case Study. *Information Systems Management*, 20(4), 43-49.
- Chen, I. J. (2001). Planning for ERP systems: analysis and future trend. *Business Process Management Journal*, 374-386.
- Daneva, M., & Wieringa, R. J. (2005). Requirements Engineering for Cross-organisational ERP Implementation: Undocumented Assumptions and Potential Mismatches. *Proceedings of the 13th IEEE Requirements Engineering Conference*, Paris.
- Davenport, T. (1998). Putting the Enterprise into the Enterprise System. *Harvard Business School Press*, 76(4), 121-131.
- Davenport, T. H., Harris, J. G., & Cantrell, S. (2004). Enterprise systems and ongoing process change. *Business Process Management Journal*, 10(1), 16-26.

- Deloitte Consulting (1999). ERP's Second Wave: Maximizing the Value of ERP-Enabled Processes.
- Dowlatshahi, S. (2005). Strategic success factors in enterprise resource-planning design and implementation: a case-study approach. *International Journal of Production Research*, 43(18), 3745-3771.
- Gattiker, T. F., & Goodhue, D. L. (2002). Software-driven changes to business processes: an empirical study of impacts of Enterprise Resource Planning (ERP) systems at the local level. *International Journal of Production Research*, 40(18), 4799-4814.
- Gattiker, T. F., & Goodhue, D. L. (2005). What Happens After ERP Implementation: Understanding the Impact of Interdependence and Differentiation on Plant-Level Outcomes. *MIS Quarterly*, 29(3), 559-585.
- Gupta, A. (2000). Enterprise Resource Planning: the emerging organisational value systems. *Industrial Management and Data Systems*, 100(3), 114-118.
- Hammer, M., & Stanton, S. (1999). How Process Enterprises Really Work. *Harvard Business Review*, 77(6), 108-118.
- Hitt, L. M., Wu, D. J., & Zhou, X. (2002). Investment in Enterprise Resource Planning: Business Impact and Productivity Measures. *Journal of Management Information Systems*, 19(1), 71-98.
- Holland, C. P., & Light, B. (1999). Global Enterprise Resource Planning Implementation. *Proceedings of the 32nd Hawaii International Conference on System Sciences*. Hawaii.
- Holsapple, C. W., Wang, Y. M., & Wu, J. H. (2005). Empirically Testing User Characteristics and Fitness Factors in Enterprise Resource Planning Success. *International Journal of Human-Computer Interaction*, 19(3), 323-342.
- Kien, S. S., & Soh, C. (2003). An Exploratory Analysis of the Sources and Nature of Misfits in ERP Implementations. In *Second - Wave Enterprise Resource Planning Systems*. Cambridge: Cambridge University Press.
- Koch, C., Slater, D., & Baatz, E. (1999). The ABCs of ERP. *CIO Magazine*, December.
- Linthicum, D. (1999). *Enterprise Application Integration*. Addison-Wesley: Reading, MA.
- Mabert, V. A., Soni, A., & Venkataramanan, M. A. (2001). Enterprise Resource Planning: Common Myths Versus Evolving Reality. *Business Horizons*, 44(3), 69-76.
- Markus, M. L., Axline, S., Petrie, D., & Tanis, C. (2000). Learning from adopters' experiences with ERP: problems encountered and success achieved. *Journal of Information Technology*, 15, 245-265.
- Markus, M. L., & Tanis, C. (2000). The Enterprise System Experience - From Adoption to Success. In R.W. Zmud (Ed.), *Framing the Domains of IT Research: Glimpsing the Future Through the Past*. Cincinnati, OH: Pinnaflex Educational Resources.
- Palaniswamy, R., & Frank, T. G. (2002). Oracle ERP and Network Computing Architecture: Implementation and Performance. *Information Systems Management*, 19(2), 53.
- Robey, D., Ross, J. W., & Boudreau, M.-C. (2002). Learning to Implement Enterprise Systems: An Exploratory Study of the Dialectics of Change. *Journal of Management Information Systems*, 19(1), 17-46.
- Ross, J. W., Vitale, M. R., & Willcocks, L. P. (2003). The Continuing ERP Revolution: Sustainable Lessons, New Modes of Delivery. In *Second - Wave Enterprise Resource Planning Systems*. Cambridge: Cambridge University Press.
- Shang, S., & Seddon, P. B. (2002). Assessing and managing the benefits of enterprise systems: the business manager's perspective. *Information Systems Journal*, 12, 271-299.
- Soh, C., Sia, S. K., Boh, W. F., & Tang, M. (2003). Misalignments in ERP Implementation: A Dialectic Perspective. *International Journal Of Human-Computer Interaction*, 16(1), 81-100.
- Somers, T. M., & Nelson, K. G. (2003). The impact of strategy and integration mechanisms on enterprise system value: Empirical evidence from manufacturing firms. *European Journal of Operational Research*, 146(2), 315-338.
- Sprague, R. (1980). A Framework for the Development of Decision Support Systems. *MIS Quarterly*, 4(4), 1-26.
- Sumner, M. (2005). *Enterprise Resource Planning*. New Jersey: Pearson Education.
- Themistocleous, M., Irani, Z., O'Keefe, R. M., & Paul, R. (2001). ERP Problems and Application Integration Issues: An Empirical Survey. *34th Hawaii International Conference on System Sciences*, Hawaii.
- Trott, P., & Hoecht, A. (2004). Enterprise Resource Planning (ERP) and its Impact on the Innovative Capability of the Firm. *International Journal of Innovation Management*, 8(4), 381-398.
- Umble, E. J., Haft, R. R., & Umble, M. M. (2003). Enterprise resource planning: Implementation procedures and critical success factors. *European Journal of Operational Research*, 146, 241-257.
- Wang, E. T., Klein, G., G., & Jiang, J. J. (2006). ERP Misfit: Country of Origin and Organisational Factors. *Journal of Management Information Systems*, 23(1), 263-292.